

## **AMENDMENTS TO THE CLAIMS**

The following listing of claims will replace all prior versions and listings of claims in the application.

### **LISTING OF CLAIMS**

1. (Currently Amended) ~~A local performance simulation system~~The system of claim 21, further comprising:

a signal generation system for simultaneously generating contact recording signals based on vibrations from an ensemble, the ensemble producing an audible ensemble sound pattern; and

a signal processing system for channelizing the contact recording signals and generating final instrument signals based on the channelized contact recording signals; and

~~— a reproduction system for generating audible sound waves based on the final instrument signals, wherein a plurality of multi-driver loudspeaker systems have assigned instruments, with one instrument assigned to one loudspeaker system, and the sound waves simulate the ensemble sound pattern with at least one multi-driver loudspeaker system driven by a weighted mixture of spectrally different instrument signals with inversion capability, thereby causing different high frequency harmonics to radiate in directions that change as musical notes change.~~

2. (Currently Amended) The ~~simulation system~~ of claim 1 wherein the ensemble includes a plurality of instruments.

3. (Currently Amended) The ~~simulation~~-system of claim 2 wherein the plurality of instruments includes a string quartet.

4. (Currently Amended) The ~~simulation~~-system of claim 2 wherein the signal generation system includes a plurality of contact recording configurations.

5. (Currently Amended) The ~~simulation~~-system of claim 4 wherein each contact recording configuration includes a pair of contact transducers coupled to a corresponding instrument at a location governed by a cross-correlation function as measured in different frequency bands.

6. (Currently Amended) The ~~simulation~~-system of claim 5 wherein the pair of contact transducers includes:

a first transducer located below an f-hole of the corresponding instrument, the first transducer generating a contact recording signal based on vibrations near the f-hole; and

a second transducer located under a bridge of the corresponding instrument, the second transducer generating a contact recording signal based on vibrations near the bridge.

7. (Currently Amended) The ~~simulation~~-system of claim 21 ~~4~~ wherein the signal processing system includes:

a storage system for storing ~~the~~-contact recording signals to a storage medium as channelized data; and

a retrieval system for retrieving the channelized data from the storage medium.

8. (Currently Amended) The ~~simulation~~-system of claim 7 wherein the storage system includes:

an analog to digital conversion system for generating digital recording signals based on the contact recording signals; and

a recording system for generating the channelized data based on the digital recording signals, the recording system recording the channelized data to the storage medium.

9. (Currently Amended) The ~~simulation~~ system of claim 8 wherein the retrieval system includes:

an equalization system for tailoring a frequency response of the channelized data;

a mixing system for generating intermediate instrument signals based on the channelized data;

a digital to analog conversion system for generating final instrument signals based on the intermediate instrument signals; and

an amplifier for amplifying the final instrument signals.

10-20. (canceled)

21. (Currently Amended) A sound reproduction system, comprising:

a first multi-driver speaker system having a first plurality of co-located speakers configured to emit sound in a first plurality of radial directions, thereby approximating a first frequency dependence of radiation from front, back and side surfaces of a first assigned instrument, ~~wherein varying piston diameters are selected based on varying surfaces of the first assigned instrument~~ wherein a front piston diameter and a rear piston diameter are chosen to respectively reproduce a forward and rear frequency dependence and polar radiation pattern of the first assigned instrument;  
and

a second multi-driver speaker system having a second plurality of co-located speakers configured to emit sound in a second plurality of radial directions, thereby approximating a second frequency dependence of radiation from front, back and side surfaces of a second assigned instrument, wherein a front piston diameter and a rear piston diameter are chosen to respectively reproduce a forward and rear frequency dependence and polar radiation pattern of the second assigned instrument ~~wherein varying piston diameters are selected based on varying surfaces of the second assigned instrument; and~~

~~a retrieval system adapted to drive a first multi-driver loudspeaker system with a first weighted mixture of spectrally different instrument signals with inversion capability from a channelized recording of the first assigned instrument, and adapted to drive a first multi-driver loudspeaker system with a second weighted mixture of spectrally different instrument signals from a channelized recording of the second assigned instrument.~~

22. (canceled)

23. (New) A multi-driver speaker system comprising:

a front speaker having a front piston diameter chosen to reproduce a forward frequency dependence of and polar radiation pattern of a front surface of a particular musical instrument; and

a rear speaker having a rear piston diameter chosen to reproduce a rearward frequency dependence of and polar radiation pattern of a rear surface of the particular musical instrument,

wherein the front and rear speakers are configured to emit sound in front and rear directions in order to approximate a frequency dependence of radiation from front and rear surfaces of the particular musical instrument.

24. (New) The system of claim 23, further comprising a side speaker having a side piston diameter chosen to reproduce a side frequency dependence of and polar radiation pattern of a side surface of the particular musical instrument, wherein the side surface is configured to emit sound in a side direction relative to the front and rear speakers in order to approximate a frequency dependence of radiation from a side surface of the particular musical instrument.

25. (New) A method of manufacturing a multi-driver speaker system, comprising:

choosing a front speaker to have a front piston diameter adapted to reproduce a forward frequency dependence of and polar radiation pattern of a front surface of a particular musical instrument;

choosing a rear speaker to have a rear piston diameter adapted to reproduce a rearward frequency dependence of and polar radiation pattern of a rear surface of the particular musical instrument; and

configuring the front and rear speakers to emit sound in front and rear directions in order to approximate a frequency dependence of radiation from front and rear surfaces of the particular musical instrument.

26. (New) The method of claim 25, further comprising:

choosing a side speaker to have a side piston diameter chosen to reproduce a side frequency dependence of and polar radiation pattern of a side surface of the particular musical instrument; and

configuring the side speaker to emit sound in a side direction relative to the front and rear speakers in order to approximate a frequency dependence of radiation from a side surface of the particular musical instrument.